

Appendix E

Cost Engineering

WALLA WALLA COST ENGINEERING MANDATORY CENTER OF EXPERTISE

COST AGENCY TECHNICAL REVIEW

CERTIFICATION STATEMENT

For Project No. 102808

POA – Little Diomed Island
Navigation Improvements

The Diomed Navigation Improvements project, as presented by Alaska District, has undergone a successful Cost Agency Technical Review (Cost ATR), performed by the Walla Walla District Cost Engineering Mandatory Center of Expertise (Cost MCX) team. The Cost ATR included study of the project scope, report, cost estimates, schedules, escalation, and risk-based contingencies. This certification signifies the products meet the quality standards as prescribed in ER 1110-2-1150 Engineering and Design for Civil Works Projects and ER 1110-2-1302 Civil Works Cost Engineering.

As of January 27, 2014, the Cost MCX certifies the estimated total project cost of:

FY 2015 Price Level: \$30,366,000
Fully Funded Amount: \$32,078,000

It remains the responsibility of the District to correctly reflect these cost values within the Final Report and to implement effective project management controls and implementation procedures including risk management throughout the life of the project.



Digitally signed by CALLAN.KIM.C.1231558221
DN: c=US, o=U.S. Government, ou=DoD, ou=PKI,
ou=USA, cn=CALLAN.KIM.C.1231558221

Kim C. Callan, PE, CCE, PM
Chief, Cost Engineering MCX
Walla Walla District

**** TOTAL PROJECT COST SUMMARY ****

PROJECT: Little Diomed Island Navigation Improvements, P2 102808
LOCATION: Little Diomed, Alaska

DISTRICT: POA Alaska
POC: CHIEF, COST ENGINEERING, Karl Harvey
PREPARED: 1/25/2014

This Estimate reflects the scope and schedule in report; Little Diomed AFB Draft Report

WBS Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST (\$K)	CNTG (\$K)	CNTG (%)	TOTAL (\$K)	ESC (%)	COST (\$K)	CNTG (\$K)	TOTAL (\$K)	Spent Thru: 1-Mar-13 (\$K)	L	COST (\$K)	CNTG (\$K)	FULL (\$K)
10	BREAKWATER & SEAWALLS	\$17,924	\$5,876	33%	\$23,800	3.5%	\$18,558	\$6,083	\$24,642	\$0		\$19,547	\$6,407	\$25,954
12	NAVIGATION PORTS & HARBORS	\$104	\$44	42%	\$148	3.0%	\$107	\$45	\$152	\$0		\$113	\$48	\$160
CONSTRUCTION ESTIMATE TOTALS:		\$18,028	\$5,919		\$23,948	3.5%	\$18,665	\$6,128	\$24,794	\$0		\$19,660	\$6,455	\$26,114
01	LANDS AND DAMAGES	\$50	\$7	15%	\$57	3.5%	\$52	\$8	\$59	\$0		\$52	\$8	\$60
30	PLANNING, ENGINEERING & DESIGN	\$2,704	\$727	27%	\$3,431	5.2%	\$2,845	\$765	\$3,610	\$0		\$2,971	\$799	\$3,770
31	CONSTRUCTION MANAGEMENT	\$1,443	\$365	25%	\$1,808	5.2%	\$1,518	\$384	\$1,902	\$0		\$1,703	\$431	\$2,133
PROJECT COST TOTALS:		\$22,225	\$7,019	32%	\$29,244		\$23,080	\$7,285	\$30,366	\$0		\$24,385	\$7,692	\$32,078

- Mandatory by Regulation CHIEF, COST ENGINEERING, Karl Harvey
- Mandatory by Regulation PROJECT MANAGER, Dave Williams
- Mandatory by Regulation CHIEF, REAL ESTATE, Thomas Kretzschmar
- CHIEF, PLANNING, Bruce Sexauer
- CHIEF, ENGINEERING, Dave Frenier
- CHIEF, OPERATIONS, Patrick Coullahan
- CHIEF, CONSTRUCTION, Dave Gerland
- CHIEF, CONTRACTING, Chris Tew
- CHIEF, PM-PB, Karen Farmer
- CHIEF, DPM, Larry McCallister

ESTIMATED FEDERAL COST: 100% \$32,078
ESTIMATED NON-FEDERAL COST: 0% \$0
ESTIMATED TOTAL PROJECT COST: \$32,078

O&M OUTSIDE OF TOTAL PROJECT COST:

**** TOTAL PROJECT COST SUMMARY ****

**** CONTRACT COST SUMMARY ****

PROJECT: Little Diomed Island Navigation Improvements, P2 102808
 LOCATION: Little Diomed, Alaska
 This Estimate reflects the scope and schedule in report; Little Diomed AFB Draft Report

DISTRICT: POA Alaska
 POC: CHIEF, COST ENGINEERING, Karl Harvey
 PREPARED: 1/25/2014

WBS Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared: 30-Jan-13				Program Year (Budget EC): 2015								
		Effective Price Level: 1-Mar-13				Effective Price Level Date: 1 OCT 14								
		RISK BASED												
WBS	Civil Works	COST	CNTG	CNTG	TOTAL	ESC	COST	CNTG	TOTAL	Mid-Point	INFLATED	COST	CNTG	FULL
NUMBER	Feature & Sub-Feature Description	(\$K)	(\$K)	(%)	(\$K)	(%)	(\$K)	(\$K)	(\$K)	Date	(%)	(\$K)	(\$K)	(\$K)
A	B	C	D	E	F	G	H	I	J	P	L	M	N	O
	PHASE 1 or CONTRACT 1													
10	BREAKWATER & SEAWALLS	\$1,837	\$683	37%	\$2,521	3.5%	\$1,902	\$708	\$2,610	2017Q4	5.3%	\$2,003	\$745	\$2,749
10	BREAKWATER & SEAWALLS	\$16,057	\$5,186	32%	\$21,243	3.5%	\$16,624	\$5,370	\$21,994	2017Q4	5.3%	\$17,510	\$5,656	\$23,166
10	BREAKWATER & SEAWALLS	\$31	\$6	19%	\$37	3.5%	\$32	\$6	\$38	2017Q4	5.3%	\$33	\$6	\$40
12	NAVIGATION PORTS & HARBORS	\$82	\$35	43%	\$118	3.0%	\$85	\$36	\$121	2017Q4	5.3%	\$89	\$38	\$127
12	NAVIGATION PORTS & HARBORS	\$22	\$9	39%	\$30	3.0%	\$22	\$9	\$31	2017Q4	5.3%	\$24	\$9	\$33
							\$0							
	CONSTRUCTION ESTIMATE TOTALS:	\$18,028	\$5,919	33%	\$23,948		\$18,665	\$6,128	\$24,794			\$19,660	\$6,455	\$26,114
01	LANDS AND DAMAGES	\$50	\$7	15%	\$57	3.5%	\$52	\$8	\$59	2015Q3	1.0%	\$52	\$8	\$60
30	PLANNING, ENGINEERING & DESIGN													
2.5%	Project Management	\$451	\$121	27%	\$572	5.2%	\$475	\$128	\$602	2015Q3	2.1%	\$484	\$130	\$615
1.0%	Planning & Environmental Compliance	\$180	\$48	27%	\$228	5.2%	\$189	\$51	\$240	2015Q3	2.1%	\$193	\$52	\$245
5.5%	Engineering & Design	\$992	\$267	27%	\$1,259	5.2%	\$1,044	\$281	\$1,324	2015Q3	2.1%	\$1,065	\$287	\$1,352
1.0%	Engineering Tech Review ITR & VE	\$180	\$48	27%	\$228	5.2%	\$189	\$51	\$240	2015Q3	2.1%	\$193	\$52	\$245
1.0%	Contracting & Reprographics	\$180	\$48	27%	\$228	5.2%	\$189	\$51	\$240	2015Q3	2.1%	\$193	\$52	\$245
2.0%	Engineering During Construction	\$361	\$97	27%	\$458	5.2%	\$380	\$102	\$482	2017Q4	12.1%	\$426	\$115	\$541
1.5%	Planning During Construction	\$270	\$73	27%	\$343	5.2%	\$284	\$76	\$360	2017Q4	12.1%	\$319	\$86	\$404
0.5%	Project Operations	\$90	\$24	27%	\$114	5.2%	\$95	\$25	\$120	2015Q3	2.1%	\$97	\$26	\$123
31	CONSTRUCTION MANAGEMENT													
3.5%	Construction Management	\$631	\$160	25%	\$791	5.2%	\$664	\$168	\$832	2017Q4	12.1%	\$745	\$188	\$933
2.0%	Project Operation:	\$361	\$91	25%	\$452	5.2%	\$380	\$96	\$476	2017Q4	12.1%	\$426	\$108	\$534
2.5%	Project Management	\$451	\$114	25%	\$565	5.2%	\$475	\$120	\$595	2017Q4	12.1%	\$532	\$135	\$667
	CONTRACT COST TOTALS:	\$22,225	\$7,019		\$29,244		\$23,080	\$7,285	\$30,366			\$24,385	\$7,692	\$32,078

Diomedé Nav Imp. S3
Y:\P\CW\W\Diomedé\DIO001 - SBH\2 Feasibility Rpt

Diomedé is located on the west coast of Little Diomedé Island in the Bering Straits, 135 miles northwest of Nome. The community is situated on a flat-topped, steep-sided island that is very isolated by its location. The community is 2.5 miles from Big Diomedé, which belongs to Russia; 0.6 miles from Russian waters and airspace; 27 miles from the Alaskan mainland; and about 685 air miles northwest of Anchorage.

Rough seas and persistent fog that shrouds the island characterizes the island during the summer months. Summer temperatures average 40 to 50 °F. Winter temperatures average from -10 to 6 °F. Annual precipitation averages 10 inches, and annual snowfall averages 30 inches. During summer months, cloudy skies and fog prevail. Winds blow consistently from the north, averaging 15 knots, with gusts of 60 to 80 mph. Storms at the site move through the area very rapidly and there is no place to run for shelter. Generally storms occur in the fall months.

The Bering Strait is generally frozen between mid-December and mid-June. Seasonal sea ice constrains the shipping season for the importation of construction materials and equipment and there are no offloading facilities other than the unimproved shore. There is very limited space available in Diomedé to serve as a staging area to store equipment or materials. Conditions permitting, a temporary airstrip may be established on a stable section of sea ice between the two islands. During the winter months of 2008 and 2009, the ice was too thin to allow construction of the ice runway.

Diomedé possesses a helipad and, conditions permitting, receives mail once a week via helicopter when not accessible by plane. The mail helicopter carries four passengers or 1,300 pounds of small freight; however, mail has priority because the U.S. Postal Service (USPS) subsidizes this service. Bad weather and/or mechanical problems frequently disrupt service and several weeks often can pass between flights.

Little Diomedé is a remote location so crew members will need to be flown to the site in a chartered helicopter, or ship up with the construction equipment. Located in the middle of the Bering Strait, the island is nearly a full day's travel by boat to Wales, the nearest community with regular air transportation service. There is no practical current or potential vehicular access to transport goods and supplies from any other portion of the island. The only access to the rest of the island is along walking trails.

Once on site the crew that will work on the project will need to have room and board provided. There is limited space to house a construction crew in Diomedé. During recent construction to improve the school, the construction crew was housed in the school, including during periods of classes. It may be possible for this contractor to put his crew up at the school. It is anticipated that the contractor will work two shifts, 10 hours a day, 7 days a week.

Large boulders and cobbles characterize the shoreline, intertidal, and near-shore habitat. The terrestrial habitat on Little Diomedé Island consists largely of boulder fields, cliffs, and rocky spires. The slopes around the island of Little Diomedé are comprised of loose boulders. These boulders can be unstable and result in slides. The boulders are also home to many species of birds. Nesting seabirds are the dominant animal life using the Little Diomedé terrestrial habitat. Seabird use of Little Diomedé Island is seasonal. Migration to the island begins with the breakup of sea ice in April and continues until mid-June. Polar bears occur in the vicinity of, and have denned on, Little Diomedé Island. At Diomedé, critical habitat includes the island itself, a 1-mile "no disturbance zone" surrounding the island, as well as all sea ice, regardless of seasonal presence, out to the international border.

Estimated by Cost Engineering Section
Designed by Hydraulics & Hydrology Section
Prepared by Al Arruda

Preparation Date 4/5/2013
Effective Date of Pricing 3/15/2013
Estimated Construction Time 730 Days

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Designed by
Hydraulics & Hydrology Section
Estimated by
Cost Engineering Section
Prepared by
Al Arruda

Design Document Draft H&H Design
Document Date 2/24/2012
District Alaska District
Contact Al Arruda 907-753-5679
Budget Year 2014
UOM System English

Direct Costs

LaborCost
EQCost
MatlCost
SubBidCost
Lump Sum

Timeline/Currency
Preparation Date 4/5/2013
Escalation Date 9/30/2012
Eff. Pricing Date 3/15/2013
Estimated Duration 730 Day(s)

Currency US dollars
Exchange Rate 1.000000

Costbook CB10EB: MII English Cost Book 2010

Labor : Alaska Labor & Mech 2013

Labor Rates

LaborCost1
LaborCost2
LaborCost3
LaborCost4

Equipment EP11R09: MII Equipment 2013 Region 09 - CW

Note: Remote construction fuel costs Jan 2013. AA

09 ALASKA

Sales Tax 0.00
Working Hours per Year 1,040
Labor Adjustment Factor 1.19
Cost of Money 2.00
Cost of Money Discount 25.00
Tire Recap Cost Factor 1.50
Tire Recap Wear Factor 1.80
Tire Repair Factor 0.15
Equipment Cost Factor 1.10
Standby Depreciation Factor 0.50

Fuel

Electricity 0.270
Gas 4.850
Diesel Off-Road 5.050
Diesel On-Road 5.150

Shipping Rates

Over 0 CWT 57.86
Over 240 CWT 48.54
Over 300 CWT 38.46
Over 400 CWT 41.99
Over 500 CWT 29.86
Over 700 CWT 27.94
Over 800 CWT 24.59

Date	Author	Note
4/13/2007	John Dudgeon	Survey Crew Estimated to be on site for the duration of the Placement of A, B, and Core rock, and any initial grading.
2/13/2009	Al Arruda	This is a Feasibility level cost estimate based upon 2009 cost estimates for Nome Breakwater. Bering Air operates regular airplane flights to Little Diomedes only a few months of each year. Cargo from Nome @ \$1.35/lb. The only runway available at the village is one plowed into the frozen sea ice. When the sea is thawed, Diomedes is only accessible by boat and helicopter. Each helicopter is flown by a single pilot and has seats for up to three passengers. Under seat stowage allows room for small back packs and gear. Visitor Facilities: One room with an efficiency kitchen is available through Inalik Native Corporation (907)686-3221, and there are no restaurant or banking services available. Laundromat with showers is available. Some groceries and hunting/fishing supplies available through the Diomedes Native Store.
2/7/2012	Al Arruda	Material Price based on 2008 IGE prices from Nome BW Construction. Assume about 155 miles by barge to Nome. Armor would average 31,400 lb and range from 23,550 lb to 39,250 lb B rock would average 3,140 lb and range between 1,570 lb to 23,550 lb Core rock would average 157 lb and range between 47 lb to 1,570 lb The dredge area is the same for all of the south alternatives. The one north alternative has a different dredge prism. Assume dredging would require moving large boulders and possibly bedrock using Backhoe and thumb. A Floating Marine Reuse Vessel will be used to haul the material 1500ft to the "reuse" site. 2-year Construction Mid-Point assumed at Jan 2015. CWCCIS 30 Sep 2012.
4/5/2013	Al Arruda	Adjusted CWE per ATR comments from LRB.

Direct Cost Markups

	Category			Method		
Productivity	Productivity			Productivity		
Overtime	Overtime			Overtime		
	<i>Days/Week</i>	<i>Hours/Shift</i>	<i>Shifts/Day</i>	<i>1st Shift</i>	<i>2nd Shift</i>	<i>3rd Shift</i>
<i>Standard</i>	5.00	8.00	1.00	8.00	0.00	0.00
<i>Actual</i>	7.00	8.00	1.00	12.00	0.00	0.00
<i>Day</i>	<i>OT Factor</i>	<i>Working</i>		<i>OT Percent</i>	<i>FCCM Percent</i>	
<i>Monday</i>	1.50	Yes		26.19	(52.38)	
<i>Tuesday</i>	1.50	Yes				
<i>Wednesday</i>	1.50	Yes				
<i>Thursday</i>	1.50	Yes				
<i>Friday</i>	1.50	Yes				
<i>Saturday</i>	1.50	Yes				
<i>Sunday</i>	1.50	Yes				

Sales Tax	TaxAdj	Running % on Selected Costs
<i>MatlCost</i>		
Mtl Esc 2013	MiscDirect	Running % on Selected Costs
<i>MatlCost</i>		

Contractor Markups

	Category	Method
Sub Contractor JOOH	JOOH	Running %
FOOH (Small Tools)	Allowance	% of Labor
FOOH	JOOH	JOOH (Calculated)
HOOH	HOOH	Running %
Sub Profit	Profit	Running %
Prime Profit	Profit	Profit Weighted Guidelines
<i>Guideline</i>	<i>Value</i>	<i>Weight</i>
<i>Risk</i>	0.120	20
<i>Difficulty</i>	0.100	15
<i>Size</i>	0.030	15
<i>Period</i>	0.120	15
<i>Invest (Contractor's)</i>	0.080	5
<i>Assist (Assistance by)</i>	0.070	5
<i>SubContracting</i>	0.100	25
<i>Total</i>		100

Bond	Bond	Running %
Prime Bond	Bond	Bond Table
<i>Class B, Tiered, 24 months, 1.00% Surcharge</i>		

<i>Contract Price</i>	<i>Bond Rate</i>
500,000	15.84
2,000,000	9.57
2,500,000	7.59
2,500,000	6.93

100,000,000,000

6.34

Owner Markups

	<i>StartDate</i>	<i>StartIndex</i>	<i>EndDate</i>	<i>EndIndex</i>	<i>Escalation</i>
Esc Jan 2016	1/1/2013	775.78	1/1/2016	817.14	5.33
Contingency		Contingency		Running %	
Owner Contgy		Contingency		Running %	
SIOH		SIOH		Running %	
EDC		MiscOwner		Running %	

<u>Description</u>	<u>Quantity</u>	<u>UOM</u>	<u>ContractCost</u>	<u>Escalation</u>	<u>Contingency</u>	<u>SIOH</u>	<u>MiscOwner</u>	<u>ProjectCost</u>
Project Cost Summary Report			22,224,824	0	7,018,973	0	0	29,243,798
Lands	1.00	EA	50,000	0	7,290	0	0	57,290
S3 Alternative	1.00	EA	18,028,312	0	5,919,348	0	0	23,947,660
(Note: This plan consists of two rubble mound breakwaters that would provide shelter from north storms and prevent shore side boulders from being transported into the landing area. The south breakwater was widened to provide an area for boat storage once removed from the water.)								
Mobilization and Demobilization, complete	2.00	LS	1,837,119	0	683,408	0	0	2,520,528
(Note: Mobilization and Demobilization for 2 years, 2 round trips complete, assumes some equipment may winter-over in Diomedes to maximise construction time.)								
Mob Equipment	2.00	EA	217,466	0	80,897	0	0	298,363
(Note: Includes time for loading onto barge and offloading for one round trip.)								
Mob Construction Facilities & Supplies	2.00	EA	30,674	0	11,411	0	0	42,085
Barge Mobilization	1.00	EA	1,468,952	0	546,450	0	0	2,015,402
Mob Personnel	24.00	PN	107,698	0	40,063	0	0	147,761
(Note: Assume 12 person crew per season, including 4 Eq Op, 3 Lab, 2 Trk Drv, 3 Eng/Mgr. Not including tug and survey subcontract crews.)								
Sitework	1.00	CY	43	0	16	0	0	59
Topographic/Hydrographic Surveys	40.00	HR	21,716	0	8,535	0	0	30,251
(Note: Survey Hours were estimated by adding the number of hours to place A Rock, B Rock, Core Rock, Sand Fill, and perform the Initial Grading.)								
North Breakwater	29,875.00	CY	6,225,379	0	2,010,797	0	0	8,236,176
Core Rock	5,501.00	ECY	943,360	0	304,705	0	0	1,248,065
(Note: 6,051cy x 1load/1300cy = 4.7 loads Assume 8.7hr load + 19.4hrs haul = 1.2 days/load + 8hrs place = 2 days/load 4.7 loads x 2 days/load = 10 days)								
Construction Revetment "Core" Rock	6,051.10	LCY	943,360	0	304,705	0	0	1,248,065
(Note: 47 lb < "C" Rock > 1570 lb Assume ave rock 157 lb and 10% shrink/loss/overplace)								
B Rock	8,818.00	ECY	1,615,447	0	521,789	0	0	2,137,236
(Note: 9,260cy x 1load/1300cy = 7.1 loads Assume 8.7hr load + 19.4hrs haul = 1.2 days/load + 10hrs place = 2 days/load 7.1 loads x 2 days/load = 14 days)								
Construction Revetment "B" Rock	9,258.90	LCY	1,615,447	0	521,789	0	0	2,137,236
(Note: 1570 lb < "B" Rock > 23,550 lb Assume ave rock 3140 lb and 5% shrink/loss/overplace)								
A Rock	15,556.00	ECY	3,666,572	0	1,184,303	0	0	4,850,874

<u>Description</u>	<u>Quantity</u>	<u>UOM</u>	<u>ContractCost</u>	<u>Escalation</u>	<u>Contingency</u>	<u>SIOH</u>	<u>MiscOwner</u>	<u>ProjectCost</u>
(Note: 15,867lcy x 1load/1300lcy = 12.2 loads Assume 8.7hr load + 19.4hrs haul = 1.2 days/load + 13hrs place = 3 days/load 12.2 loads x 3 days/load = 37 days)								
Construction Revetment "A" Rock	15,867.12	LCY	3,666,572	0	1,184,303	0	0	4,850,874
(Note: 23,550 lb < "A" Rock > 39,250 lb Assume ave rock 31,400 lb and 2% shrink/loss/overplace The armor stone size of 15.7 ton exceeds the minimum 8 ton requirement for Nome.)								
South Breakwater	48,540.00	CY	9,831,131	0	3,175,455	0	0	13,006,586
Core Rock	13,447.00	ECY	2,307,980	0	745,478	0	0	3,053,458
(Note: 14,792lcy x 1load/1300lcy = 11.4 loads Assume 8.7hr load + 19.4hrs haul = 1.2 days/load + 8hrs place = 2 days/load 11.4 loads x 2 days/load = 23 days)								
Construction Revetment "Core" Rock	14,791.70	LCY	2,307,980	0	745,478	0	0	3,053,458
(Note: 47 lb < "C" Rock > 1570 lb Assume ave rock 157 lb and 10% shrink/loss/overplace)								
B Rock	14,253.00	ECY	2,611,132	0	843,396	0	0	3,454,528
(Note: 14,966lcy x 1load/1300lcy = 11.5 loads Assume 8.7hr load + 19.4hrs haul = 1.2 days/load + 10hrs place = 2 days/load 11.5 loads x 2 days/load = 23 days)								
Construction Revetment "B" Rock 1ft thick	14,965.65	LCY	2,611,132	0	843,396	0	0	3,454,528
(Note: 1570 lb < "B" Rock > 23,550 lb Assume ave rock 3140 lb and 5% shrink/loss/overplace)								
A Rock	20,840.00	ECY	4,912,018	0	1,586,582	0	0	6,498,600
(Note: 21,256lcy x 1load/1300lcy = 16.4 loads Assume 8.7hr load + 19.4hrs haul = 1.2 days/load + 13hrs place = 3 days/load 16.4 loads x 3 days/load = 49 days)								
Construction Revetment "A" Rock 3ft thick	21,256.80	LCY	4,912,018	0	1,586,582	0	0	6,498,600
(Note: 23,550 lb < "A" Rock > 39,250 lb Assume ave rock 31,400 lb and 2% shrink/loss/overplace The armor stone size of 15.7 ton exceeds the minimum 8 ton requirement for Nome.)								
Dredging	3,000.00	CY	82,251	0	35,286	0	0	117,536
(Note: Dredging. In this option a small area nearshore would be dredged to -10 feet MLLW to provide boats a rock free approach to shore and room to turn around once launched. It is assumed that the dredging would include boulders and could possibly need blasting. Approximately 2,000 cubic yards would need to be removed for this alternative.)								
Land-based	3,000.00	BCY	19,165	0	8,222	0	0	27,387
Drill/Blast	3,000.00	BCY	63,085	0	27,064	0	0	90,149
Nav Aids	1.00	EA	30,717	0	5,867	0	0	36,584
(Note: The Coast Guard may require a fixed navigation aid for the breakwater. During development of plans and specifications the Coast Guard will be contacted to determine the navigation aid requirements. Any navigation aid other than the Coast Guard required aid would be a local cost and maintenance responsibility.)								

<u>Description</u>	<u>Quantity</u>	<u>UOM</u>	<u>ContractCost</u>	<u>Escalation</u>	<u>Contingency</u>	<u>SIOH</u>	<u>MiscOwner</u>	<u>ProjectCost</u>
PED	1.00	EA	2,704,247	0	727,442	0	0	3,431,689
SIOH	1.00	EA	1,442,265	0	364,893	0	0	1,807,158

Abbreviated Risk Analysis

Project (less than \$40M): **Diomedes Nav Improvements S3**
 Project Development Stage: **Recon/Feasibility**

Total Construction Contract Cost = **\$ 18,028,313**

	<u>WBS</u>	<u>Potential Risk Areas</u>	<u>Contract Cost</u>		<u>% Contingency</u>	<u>\$ Contingency</u>	<u>Total</u>
1	01 LANDS AND DAMAGES	Lands Acquisition	\$ 50,000	0.3%	14.58%	\$ 7,292	\$ 57,292
2	02 RELOCATIONS	Relocate Helipad	\$ -	0.0%	6.25%	\$ -	\$ -
3	08 01 ROADS	Access Road	\$ -	0.0%	20.83%	\$ -	\$ -
4	08 01 ROADS	Uplands Parking Pad	\$ -	0.0%	16.67%	\$ -	\$ -
5	10 BREAKWATERS AND SEAWALLS	Mob/Demob	\$ 1,837,119	10.2%	37.20%	\$ 683,408	\$ 2,520,527
6	10 BREAKWATERS AND SEAWALLS	North Rubblemound Breakwater	\$ 6,225,379	34.5%	32.30%	\$ 2,010,797	\$ 8,236,176
7	10 BREAKWATERS AND SEAWALLS	South Rubblemound Breakwater	\$ 9,831,131	54.5%	32.30%	\$ 3,175,455	\$ 13,006,586
8	10 BREAKWATERS AND SEAWALLS	Nav Marker Base	\$ 30,717	0.2%	19.10%	\$ 5,867	\$ 36,584
9	12 02 HARBORS	Dredging Rock	\$ 82,251	0.5%	42.90%	\$ 35,286	\$ 117,537
10	12 02 HARBORS	Hydro Surveys	\$ 21,716	0.1%	39.30%	\$ 8,534	\$ 30,250
11	17 BEACH REPLENISHMENT	Habitat Enhancement	\$ -	0.0%	16.67%	\$ -	\$ -
12	18 CULTURAL RESOURCE PRESERVATION	Archeology	\$ -	0.0%	14.58%	\$ -	\$ -
13	30 PLANNING, ENGINEERING, AND DESIGN	Planning, Engineering, & Design	\$ 2,704,247	15.0%	26.90%	\$ 727,442	\$ 3,431,689
14	31 CONSTRUCTION MANAGEMENT	Construction Management	\$ 1,442,265	8.0%	25.30%	\$ 364,893	\$ 1,807,158

Totals							
	Total Construction Estimate	\$	18,078,313		32.78%	\$	5,926,640
	Total Planning, Engineering & Design	\$	2,704,247		26.90%	\$	727,442
	Total Construction Management	\$	1,442,265		25.30%	\$	364,893
	Total	\$	22,224,825			\$	7,018,975

Diomedé Nav Improvements S3

Recon/Feasibility
Abbreviated Risk Analysis

Meeting Date: 2-Jan-13

Risk Level

Very Likely	2	3	4	5	5
Likely	1	2	4	5	5
Unlikely	0	1	3	3	4
Very Unlikely	0	0	1	2	4
	Negligible	Marginal	Significant	Critical	Crisis

Risk Element	Potential Risk Areas	Concerns	PDT Discussions & Conclusions (Include logic & justification for choice of Likelihood & Impact)	Likelihood	Impact	Risk Level
Project Scope		Does Project accomplish intent?				
PS-1	Lands Acquisition	Non-Availability of land for construction access or project features - need to accomplish intent.	The State of Alaska owns the tides and submerged lands lying within this section, and the City owns the uplands. Local village is motivated to make land available	Very Unlikely	Significant	1
PS-2	Relocate Helipad	Possible interference with existing helipad - possible scope change.	Year-round access to Diomedé is currently limited to helicopter. The State of Alaska owns the helipad and has a protective interagency land management agreement that extends into the Bering Sea. No known utilities or facilities are located in this area and no relocations are required.	Very Unlikely	Significant	1
PS-3	Access Road	No construction of access road to new harbor by others - possible scope change.	The community's location is the only area which does not have near-vertical cliffs to the water. Additional Road construction would not improve access to the landing.	Unlikely	Critical	3
PS-4	Uplands Parking Pad	Local Dredge material for support/access pad - possible scope change.	The shoreline consists of large rock and boulders with no semblance of a beach. There are no improved landing ramps, areas of protected moorage, or protected storage areas along the beach.	Unlikely	Significant	3
PS-5	Mob/Demob	Contractor mob/demob distance is greater than estimated - possible scope change.	The island is about 685 miles northwest of Anchorage, 135 miles northwest of Nome, and only 2.5 miles east of Big Diomedé Island in Russia. Lack of local competition will result in contractor traveling farther.	LIKELY	Negligible	1
PS-6	North Rubblemound Breakwater	Breakwater Storm Protection is lower than estimated - Lack of wave protection will result in lower benefits - possible scope change.	Quantities of breakwater materials are fairly certain given the changing nature of the slope and beach.	Unlikely	Significant	3
PS-7	South Rubblemound Breakwater	Breakwater Storm Protection is lower than estimated - Lack of wave protection will result in lower benefits - possible scope change.	Quantities of breakwater materials are fairly certain given the changing nature of the slope and beach.	Unlikely	Significant	3
PS-8	Nav Marker Base	Contractor inability to construct Nav Base - need to accomplish intent.	Base may be pre-cast or cast-in-place and is not a large item	Very Unlikely	Marginal	0
PS-9	Dredging Rock	Contractor inability to Dredging Rock - need to accomplish intent.	The shoreline consists of large rock and boulders with no semblance of a beach.	LIKELY	Marginal	2
PS-10	Hydro Surveys	Contractor inability to perform Surveys - possible scope change.	Sub-Contractor willingness for remote site work is driver	Unlikely	Critical	3
PS-11	Habitat Enhancement	The slopes around the island of Little Diomedé are comprised of loose boulders. These boulders can be unstable and result in slides. The steep boulder-studded slopes, rocky cliffs, rich surrounding waters, and relatively low predator pressure at Little Diomedé Island create important breeding habitat for millions of seabirds - possible scope change.	The dredged material would be used for habitat enhancement in the nearshore environment approximately 1,500 feet from the construction site. This distance would provide a beneficial use/enhancement area away from existing village activities; the specific placement site would be determined with further coordination among resource agencies.	Unlikely	Marginal	1
PS-12	Archeology	Artifacts and human remains are occasionally found on the surface, having eroded out of the soil or been exposed by construction work or other activities. Need for inspection of work site for unforeseen cultural artifacts or graves - possible scope change.	Not likely but possible to excavate significant artifacts	Unlikely	Significant	3
PS-13	Planning, Engineering, & Design	Current plan scope inadequate requiring additional effort - need to accomplish intent.	Design process will assess potential for future access improvement	Very Unlikely	Significant	1
PS-14	Construction Management	Current plan scope inadequate requiring additional effort - need to accomplish intent.	Design process will assess potential for future access improvement	Very Unlikely	Marginal	0

Diomed Nav Improvements S3

Recon/Feasibility
Abbreviated Risk Analysis

Meeting Date: 2-Jan-13

Risk Level

Very Likely	2	3	4	5	5
Likely	1	2	4	5	5
Unlikely	0	1	3	3	4
Very Unlikely	0	0	1	2	4
	Negligible	Marginal	Significant	Critical	Crisis

Risk Element	Potential Risk Areas	Concerns	PDT Discussions & Conclusions (Include logic & justification for choice of Likelihood & Impact)	Likelihood	Impact	Risk Level
Acquisition Strategy		Type of Contract / Method of Procurement / Measurement & Payment ?				
AS-1	Lands Acquisition	Non-Availability of land for construction access or project features - need to acquire additional lands.	Local village is motivated to make land available for a fee	Very Unlikely	Marginal	0
AS-2	Relocate Helipad	Possible interference with existing helipad - need to acquire additional lands.	Year-round access to Diomed is currently limited to helicopter. The State of Alaska owns the helipad and has a protective interagency land management agreement that extends into the Bering Sea. No known utilities or facilities are located in this area and no relocations are required.	Very Unlikely	Significant	1
AS-3	Access Road	No construction of access road to new harbor by others - need to acquire additional lands.	The community's location is the only area which does not have near-vertical cliffs to the water. Additional Road construction would not improve access to the landing.	Unlikely	Marginal	1
AS-4	Uplands Parking Pad	Local Dredge material for support/access pad - need to adjust schedule/duration.	The shoreline consists of large rock and boulders with no semblance of a beach. There are no improved landing ramps, areas of protected moorage, or protected storage areas along the beach.	Unlikely	Negligible	0
AS-5	Mob/Demob	Contractor bid price for mob/demob is higher than estimated - need to adjust schedule/duration.	The island is about 685 miles northwest of Anchorage, 135 miles northwest of Nome, and only 2.5 miles east of Big Diomed Island in Russia. Lack of local competition will result in contractor traveling farther.	LIKELY	Marginal	2
AS-6	North Rubblemound Breakwater	Lack of local quarry competition will result in higher rock costs/bids - Contractor bid price for rock is higher than estimated - possible 8A contract.	Quantities of breakwater materials are fairly certain given the changing nature of the slope and beach.	Unlikely	Marginal	1
AS-7	South Rubblemound Breakwater	Lack of local quarry competition will result in higher rock costs/bids - Contractor bid price for rock is higher than estimated - possible 8A contract.	Quantities of breakwater materials are fairly certain given the changing nature of the slope and beach.	Unlikely	Marginal	1
AS-8	Nav Marker Base	Contractor inability to construct Nav Base - need to adjust schedule/duration.	Base may be pre-cast or cast-in-place and is not a large item	Unlikely	Marginal	1
AS-9	Dredging Rock	Contractor bid price for Dredging Rock is higher than estimated - possible 8A contract.	Extent of rock quantity/depth is unknown without sampling	LIKELY	Significant	4
AS-10	Hydro Surveys	Contractor bid price for Surveys is higher than estimated - possible 8A contract.	Sub-Contractor willingness for remote site work is driver	Unlikely	Negligible	0
AS-11	Habitat Enhancement	The slopes around the island of Little Diomed are comprised of loose boulders. These boulders can be unstable and result in slides. The steep boulder-studded slopes, rocky cliffs, rich surrounding waters, and relatively low predator pressure at Little Diomed Island create important breeding habitat for millions of seabirds - need to adjust schedule/duration.	The dredged material would be used for habitat enhancement in the nearshore environment approximately 1,500 feet from the construction site. This distance would provide a beneficial use/enhancement area away from existing village activities; the specific placement site would be determined with further coordination among resource agencies.	Unlikely	Negligible	0
AS-12	Archeaology	Artifacts and human remains are occasionally found on the surface, having eroded out of the soil or been exposed by construction work or other activities. Will inspect work site for unforeseen cultural artifacts or graves - need to adjust schedule/duration.	Not likely but possible to excavate significant artifacts	Very Unlikely	Marginal	0
AS-13	Planning, Engineering, & Design	Current contract proposal inadequate requiring additional effort - need to adjust schedule/duration.	Design process will assess potential for future storm damage	Very Unlikely	Significant	1
AS-14	Construction Management	Current contract proposal inadequate requiring additional effort - need to adjust schedule/duration.	Design process will assess potential for future storm damage	LIKELY	Negligible	1

Diomedé Nav Improvements S3

Recon/Feasibility
Abbreviated Risk Analysis

Meeting Date: 2-Jan-13

Risk Level

Very Likely	2	3	4	5	5
Likely	1	2	4	5	5
Unlikely	0	1	3	3	4
Very Unlikely	0	0	1	2	4
	Negligible	Marginal	Significant	Critical	Crisis

Risk Element	Potential Risk Areas	Concerns	PDT Discussions & Conclusions (Include logic & justification for choice of Likelihood & Impact)	Likelihood	Impact	Risk Level
Construction Complexity		Constructibility issues / Methods / Schedule?				
CC-1	Lands Acquisition	Non-Availability of land for construction access or project features - project constructible.	Local village is motivated to make land available	Unlikely	Marginal	1
CC-2	Relocate Helipad	Possible interference with existing helipad - project constructible.	Year-round access to Diomedé is currently limited to helicopter. The State of Alaska owns the helipad and has a protective interagency land management agreement that extends into the Bering Sea. No known utilities or facilities are located in this area and no relocations are required.	Unlikely	Marginal	1
CC-3	Access Road	No construction of access road to harbor - special construction equipment.	The community's location is the only area which does not have near-vertical cliffs to the water. Additional Road construction would not improve access to the landing.	Unlikely	Significant	3
CC-4	Uplands Parking Pad	Local Dredge material for support/access pad - special construction equipment.	The shoreline consists of large rock and boulders with no semblance of a beach. There are no improved landing ramps, areas of protected moorage, or protected storage areas along the beach.	LIKELY	Marginal	2
CC-5	Mob/Demob	Contractor mob/demob distance is greater than estimated - project constructible.	The island is about 685 miles northwest of Anchorage, 135 miles northwest of Nome, and only 2.5 miles east of Big Diomedé Island in Russia. Lack of local competition will result in contractor traveling farther.	LIKELY	Marginal	2
CC-6	North Rubblemound Breakwater	Lack of local quarry competition will result in higher rock costs/bids - Contractor bid price for rock is higher than estimated - unique methods of construction.	Quantities of breakwater materials are fairly certain given the changing nature of the slope and beach.	Very Unlikely	Marginal	0
CC-7	South Rubblemound Breakwater	Lack of local quarry competition will result in higher rock costs/bids - Contractor bid price for rock is higher than estimated - unique methods of construction.	Quantities of breakwater materials are fairly certain given the changing nature of the slope and beach.	Very Unlikely	Marginal	0
CC-8	Nav Marker Base	Contractor inability to construct Nav Base - unique methods of construction.	Base may be pre-cast or cast-in-place and is not a large item	Very Unlikely	Negligible	0
CC-9	Dredging Rock	Contractor effort for Dredging Rock is higher than estimated - unique methods of construction.	Extent of rock quantity/depth is unknown without sampling	LIKELY	Marginal	2
CC-10	Hydro Surveys	Contractor bid price for Surveys is higher than estimated - special construction equipment.	Sub-Contractor willingness for remote site work is driver. Surveys may need to be repeated.	Unlikely	Significant	3
CC-11	Habitat Enhancement	The slopes around the island of Little Diomedé are comprised of loose boulders. These boulders can be unstable and result in slides. The steep boulder-studded slopes, rocky cliffs, rich surrounding waters, and relatively low predator pressure at Little Diomedé Island create important breeding habitat for millions of seabirds - project constructible.	The dredged material would be used for habitat enhancement in the nearshore environment approximately 1,500 feet from the construction site. This distance would provide a beneficial use/enhancement area away from existing village activities; the specific placement site would be determined with further coordination among resource agencies.	Unlikely	Marginal	1
CC-12	Archeology	Artifacts and human remains are occasionally found on the surface, having eroded out of the soil or been exposed by construction work or other activities. Need to inspect work site for unforeseen cultural artifacts or graves - project constructible.	Not likely but possible to excavate significant artifacts	Very Unlikely	Significant	1
CC-13	Planning, Engineering, & Design	Current plan proposal inadequate requiring additional effort - project constructible.	Design process will assess potential for future storm damage	Very Unlikely	Significant	1
CC-14	Construction Management	Current plan proposal inadequate requiring additional effort - project constructible.	Design process will assess potential for future storm damage	LIKELY	Negligible	1

Diomedé Nav Improvements S3

Recon/Feasibility
Abbreviated Risk Analysis

Meeting Date: 2-Jan-13

Risk Level

Very Likely	2	3	4	5	5
Likely	1	2	4	5	5
Unlikely	0	1	3	3	4
Very Unlikely	0	0	1	2	4
	Negligible	Marginal	Significant	Critical	Crisis

Risk Element	Potential Risk Areas	Concerns	PDT Discussions & Conclusions (Include logic & justification for choice of Likelihood & Impact)	Likelihood	Impact	Risk Level
Volatile Commodities						
Materials or Equipment costs subject to fluctuation?						
VC-1	Lands Acquisition	Cost of land for construction access or project features	Local village is motivated to make land available	LIKELY	Negligible	1
VC-2	Relocate Helipad	Cost of reducing interference with existing helipad	Year-round access to Diomedé is currently limited to helicopter. The State of Alaska owns the helipad and has a protective interagency land management agreement that extends into the Bering Sea. No known utilities or facilities are located in this area and no relocations are required.	Very Unlikely	Marginal	0
VC-3	Access Road	Cost of construction of access road to new harbor by others	The community's location is the only area which does not have near-vertical cliffs to the water. Additional Road construction would not improve access to the landing.	Unlikely	Marginal	1
VC-4	Uplands Parking Pad	Cost of Local Dredge material for support/access pad	The shoreline consists of large rock and boulders with no semblance of a beach. There are no improved landing ramps, areas of protected moorage, or protected storage areas along the beach.	Very Unlikely	Marginal	0
VC-5	Mob/Demob	Contractor bid price for mob/demob is higher than estimated	The island is about 685 miles northwest of Anchorage, 135 miles northwest of Nome, and only 2.5 miles east of Big Diomedé Island in Russia. Lack of local competition will result in contractor traveling farther.	LIKELY	Significant	4
VC-6	North Rubblemound Breakwater	Contractor bid price for rock is higher than estimated	Quantities of breakwater materials are fairly certain given the changing nature of the slope and beach.	LIKELY	Significant	4
VC-7	South Rubblemound Breakwater	Contractor bid price for Nav Base is higher than estimated	Quantities of breakwater materials are fairly certain given the changing nature of the slope and beach.	LIKELY	Significant	4
VC-8	Nav Marker Base	Contractor bid price for Nav Marker Base is higher than estimated	Base may be pre-cast or cast-in-place and is not a large item	Unlikely	Marginal	1
VC-9	Dredging Rock	Contractor bid price for Dredging Rock is higher than estimated	Extent of rock quantity/depth is unknown without sampling	LIKELY	Marginal	2
VC-10	Hydro Surveys	Contractor bid price for Surveys is higher than estimated	Sub-Contractor prices may be high for remote site work	LIKELY	Marginal	2
VC-11	Habitat Enhancement	The slopes around the island of Little Diomedé are comprised of loose boulders. These boulders can be unstable and result in slides. The steep boulder-studded slopes, rocky cliffs, rich surrounding waters, and relatively low predator pressure at Little Diomedé Island create important breeding habitat for millions of seabirds - cost of habitat enhancement.	The dredged material would be used for habitat enhancement in the nearshore environment approximately 1,500 feet from the construction site. This distance would provide a beneficial use/enhancement area away from existing village activities; the specific placement site would be determined with further coordination among resource agencies.	Unlikely	Marginal	1
VC-12	Archeology	Artifacts and human remains are occasionally found on the surface, having eroded out of the soil or been exposed by construction work or other activities. Need for inspection of work site for unforeseen cultural artifacts or graves - cost of artifact recovery.	Not likely but possible to excavate significant artifacts	Very Unlikely	Significant	1
VC-13	Planning, Engineering, & Design	Current plan proposal inadequate requiring additional effort	Design process will assess potential for future storm damage	Very Unlikely	Significant	1
VC-14	Construction Management	Current plan proposal inadequate requiring additional effort	Design process will assess potential for future storm damage	Very Unlikely	Marginal	0

Diomedé Nav Improvements S3

Recon/Feasibility
Abbreviated Risk Analysis

Meeting Date: 2-Jan-13

Risk Level

Very Likely	2	3	4	5	5
Likely	1	2	4	5	5
Unlikely	0	1	3	3	4
Very Unlikely	0	0	1	2	4
	Negligible	Marginal	Significant	Critical	Crisis

Risk Element	Potential Risk Areas	Concerns	PDT Discussions & Conclusions (Include logic & justification for choice of Likelihood & Impact)	Likelihood	Impact	Risk Level
Quantities		Level of confidence in the quantities?				
Q-1	Lands Acquisition	Insufficient land for construction access or project features	Local village is motivated to make land available	Very Unlikely	Negligible	0
Q-2	Relocate Helipad	Added material/effort to reduce interference with existing helipad	Year-round access to Diomedé is currently limited to helicopter. The State of Alaska owns the helipad and has a protective interagency land management agreement that extends into the Bering Sea. No known utilities or facilities are located in this area and no relocations are required.	Very Unlikely	Negligible	0
Q-3	Access Road	Added material/effort for construction of access road to new harbor	The community's location is the only area which does not have near-vertical cliffs to the water. Additional Road construction would not improve access to the landing.	Unlikely	Marginal	1
Q-4	Uplands Parking Pad	Added Local Dredge material for support/access pad	The shoreline consists of large rock and boulders with no semblance of a beach. There are no improved landing ramps, areas of protected moorage, or protected storage areas along the beach.	Very Unlikely	Marginal	0
Q-5	Mob/Demob	Added material/effort for mob/demob is higher than estimated	The island is about 685 miles northwest of Anchorage, 135 miles northwest of Nome, and only 2.5 miles east of Big Diomedé Island in Russia. Lack of local competition will result in contractor traveling farther.	Unlikely	Marginal	1
Q-6	North Rubblemound Breakwater	Contractor bid qty for rock is higher than estimated	Quantities of breakwater materials are fairly certain given the changing nature of the slope and beach.	Very Unlikely	Marginal	0
Q-7	South Rubblemound Breakwater	Contractor bid qty for rock is higher than estimated	Quantities of breakwater materials are fairly certain given the changing nature of the slope and beach.	Very Unlikely	Marginal	0
Q-8	Nav Marker Base	Contractor bid qty for Nav Marker Base is higher than estimated	Base may be pre-cast or cast-in-place and is not a large item	LIKELY	Marginal	2
Q-9	Dredging Rock	Contractor effort for Dredging Rock is higher than estimated	Extent of rock quantity/depth is unknown without sampling	LIKELY	Significant	4
Q-10	Hydro Surveys	Added material/effort for surveys is higher than estimated	Verification surveys may need to be repeated	Unlikely	Significant	3
Q-11	Habitat Enhancement	The slopes around the island of Little Diomedé are comprised of loose boulders. These boulders can be unstable and result in slides. The steep boulder-studded slopes, rocky cliffs, rich surrounding waters, and relatively low predator pressure at Little Diomedé Island create important breeding habitat for millions of seabirds - Added material/effort for habitat enhancement.	The dredged material would be used for habitat enhancement in the nearshore environment approximately 1,500 feet from the construction site. This distance would provide a beneficial use/enhancement area away from existing village activities; the specific placement site would be determined with further coordination among resource agencies.	Unlikely	Marginal	1
Q-12	Archeaology	Artifacts and human remains are occasionally found on the surface, having eroded out of the soil or been exposed by construction work or other activities. Need for inspection of work site for unforeseen cultural artifacts or graves - Added material/effort for artifact recovery.	Not likely but possible to excavate significant artifacts	Very Unlikely	Negligible	0
Q-13	Planning, Engineering, & Design	Current plan proposal inadequate requiring additional effort	Design process will assess potential for future storm damage	Very Unlikely	Significant	1
Q-14	Construction Management	Current plan proposal inadequate requiring additional effort	Design process will assess potential for future storm damage	LIKELY	Marginal	2

Diomed Nav Improvements S3

Recon/Feasibility
Abbreviated Risk Analysis

Meeting Date: 2-Jan-13

Risk Level

Very Likely	2	3	4	5	5
Likely	1	2	4	5	5
Unlikely	0	1	3	3	4
Very Unlikely	0	0	1	2	4
	Negligible	Marginal	Significant	Critical	Crisis

Risk Element	Potential Risk Areas	Concerns	PDT Discussions & Conclusions (Include logic & justification for choice of Likelihood & Impact)	Likelihood	Impact	Risk Level
Fabrication & Project Installed Equipment						
Confidence in contractor to manufacture / install Unusual parts, materials ?						
FI-1	Lands Acquisition	Contractor needs access to land for construction access or project features	Local village is motivated to make land available	Very Unlikely	Significant	1
FI-2	Relocate Helipad	Possible interference with existing helipad	Year-round access to Diomed is currently limited to helicopter. The State of Alaska owns the helipad and has a protective interagency land management agreement that extends into the Bering Sea. No known utilities or facilities are located in this area and no relocations are required.	Very Unlikely	Negligible	0
FI-3	Access Road	No construction of access road to new harbor by others	The community's location is the only area which does not have near-vertical cliffs to the water. Additional Road construction would not improve access to the landing.	Very Unlikely	Marginal	0
FI-4	Uplands Parking Pad	Local Dredge material for support/access pad	The shoreline consists of large rock and boulders with no semblance of a beach. There are no improved landing ramps, areas of protected moorage, or protected storage areas along the beach.	Very Unlikely	Negligible	0
FI-5	Mob/Demob	Ability of contractor to mob/demob	The island is about 685 miles northwest of Anchorage, 135 miles northwest of Nome, and only 2.5 miles east of Big Diomed Island in Russia. Lack of local competition will result in contractor traveling farther.	Unlikely	Marginal	1
FI-6	North Rubblemound Breakwater	Ability of contractor to install rock rubblemound	Rubblemound construction is well understood by competent contractors	Very Unlikely	Significant	1
FI-7	South Rubblemound Breakwater	Ability of contractor to install rock rubblemound	Base may be pre-cast or cast-in-place and set into rubblemound	Very Unlikely	Significant	1
FI-8	Nav Marker Base	Ability of contractor to install nav marker base	Base may be pre-cast or cast-in-place and is not a large item	Very Unlikely	Marginal	0
FI-9	Dredging Rock	Ability of contractor to Dredge Rock	Extent of rock density/depth is unknown without sampling	Unlikely	Marginal	1
FI-10	Hydro Surveys	Ability of contractor to complete surveys	Competent Sub-Contractor prices may be high for remote site work	Very Unlikely	Significant	1
FI-11	Habitat Enhancement	The slopes around the island of Little Diomed are comprised of loose boulders. These boulders can be unstable and result in slides. The steep boulder-studded slopes, rocky cliffs, rich surrounding waters, and relatively low predator pressure at Little Diomed Island create important breeding habitat for millions of seabirds - Ability of contractor for habitat enhancement.	The dredged material would be used for habitat enhancement in the nearshore environment approximately 1,500 feet from the construction site. This distance would provide a beneficial use/enhancement area away from existing village activities; the specific placement site would be determined with further coordination among resource agencies.	Very Unlikely	Significant	1
FI-12	Archeaology	Artifacts and human remains are occasionally found on the surface, having eroded out of the soil or been exposed by construction work or other activities. Need for inspection of work site for unforeseen cultural artifacts or graves - Ability of contractor for artifact recovery.	Not likely but possible to excavate significant artifacts	Very Unlikely	Marginal	0
FI-13	Planning, Engineering, & Design	Current plan proposal requiring unusual materials or equipment	Design process will assess potential for future storm damage	Very Unlikely	Significant	1
FI-14	Construction Management	Current plan proposal requiring unusual materials or equipment	Design process will assess potential for future storm damage	Unlikely	Marginal	1

Diomedé Nav Improvements S3

Recon/Feasibility
Abbreviated Risk Analysis

Meeting Date: 2-Jan-13

Risk Level

Very Likely	2	3	4	5	5
Likely	1	2	4	5	5
Unlikely	0	1	3	3	4
Very Unlikely	0	0	1	2	4
	Negligible	Marginal	Significant	Critical	Crisis

Risk Element	Potential Risk Areas	Concerns	PDT Discussions & Conclusions (Include logic & justification for choice of Likelihood & Impact)	Likelihood	Impact	Risk Level
Cost Estimating Method		Assumptions made, and effect on cost estimate?				
CE-1	Lands Acquisition	Qty of land insufficient for construction access or project features	Local village is motivated to make land available	Very Unlikely	Negligible	0
CE-2	Relocate Helipad	Added qty/effort to reduce interference with existing helipad	Year-round access to Diomedé is currently limited to helicopter. The State of Alaska owns the helipad and has a protective interagency land management agreement that extends into the Bering Sea. No known utilities or facilities are located in this area and no relocations are required.	Very Unlikely	Negligible	0
CE-3	Access Road	Added qty/effort for construction of access road to new harbor	The community's location is the only area which does not have near-vertical cliffs to the water. Additional Road construction would not improve access to the landing.	Very Unlikely	Negligible	0
CE-4	Uplands Parking Pad	Added qty/effort for support/access pad	The shoreline consists of large rock and boulders with no semblance of a beach. There are no improved landing ramps, areas of protected moorage, or protected storage areas along the beach.	Unlikely	Marginal	1
CE-5	Mob/Demob	Added crew/effort for mob/demob is higher than estimated	The island is about 685 miles northwest of Anchorage, 135 miles northwest of Nome, and only 2.5 miles east of Big Diomedé Island in Russia. Lack of local competition will result in contractor traveling farther.	LIKELY	Significant	4
CE-6	North Rubblemound Breakwater	Current plan qty for rock is higher than estimated	Quantities of breakwater materials are fairly certain given the changing nature of the slope and beach.	Unlikely	Marginal	1
CE-7	South Rubblemound Breakwater	Current plan qty for rock is higher than estimated	Quantities of breakwater materials are fairly certain given the changing nature of the slope and beach.	Unlikely	Marginal	1
CE-8	Nav Marker Base	Current plan qty for Nav Marker Base is higher than estimated	Base may be pre-cast or cast-in-place and is not a large item	Unlikely	Negligible	0
CE-9	Dredging Rock	Current plan qty for Dredging Rock is higher than estimated	Extent of rock quantity/depth is unknown without sampling	LIKELY	Significant	4
CE-10	Hydro Surveys	Added crew/effort for surveys is higher than estimated	Sub-Contractor prices may be high for remote site work	Unlikely	Marginal	1
CE-11	Habitat Enhancement	The slopes around the island of Little Diomedé are comprised of loose boulders. These boulders can be unstable and result in slides. The steep boulder-studded slopes, rocky cliffs, rich surrounding waters, and relatively low predator pressure at Little Diomedé Island create important breeding habitat for millions of seabirds - Added qty/effort for habitat enhancement.	The dredged material would be used for habitat enhancement in the nearshore environment approximately 1,500 feet from the construction site. This distance would provide a beneficial use/enhancement area away from existing village activities; the specific placement site would be determined with further coordination among resource agencies.	Unlikely	Negligible	0
CE-12	Archeaology	Artifacts and human remains are occasionally found on the surface, having eroded out of the soil or been exposed by construction work or other activities. Need for inspection of work site for unforeseen cultural artifacts or graves - Added qty/effort for artifact recovery.	Not likely but possible to excavate significant artifacts	Very Unlikely	Significant	1
CE-13	Planning, Engineering, & Design	Current plan quantities inadequate requiring additional effort	Design process will assess potential for future storm damage	Very Unlikely	Significant	1
CE-14	Construction Management	Current plan proposal quantities inadequate requiring additional effort	Design process will assess potential for future storm damage	Very Unlikely	Marginal	0

Diomedé Nav Improvements S3

Recon/Feasibility
Abbreviated Risk Analysis

Meeting Date: 2-Jan-13

Risk Level

Very Likely	2	3	4	5	5
Likely	1	2	4	5	5
Unlikely	0	1	3	3	4
Very Unlikely	0	0	1	2	4
	Negligible	Marginal	Significant	Critical	Crisis

Risk Element	Potential Risk Areas	Concerns	PDT Discussions & Conclusions (Include logic & justification for choice of Likelihood & Impact)	Likelihood	Impact	Risk Level
External Project Risks						
Politics, Weather, Environment, Funding, Other Projects ?						
EX-1	Lands Acquisition	Political influences and affect on land for construction access or project features	Local village is motivated to make land available	Unlikely	Significant	3
EX-2	Relocate Helipad	Adverse weather affect reduction in interference with existing helipad	Year-round access to Diomedé is currently limited to helicopter. The State of Alaska owns the helipad and has a protective interagency land management agreement that extends into the Bering Sea. No known utilities or facilities are located in this area and no relocations are required.	Very Unlikely	Negligible	0
EX-3	Access Road	Adverse weather affect construction of access road to existing harbor	The community's location is the only area which does not have near-vertical cliffs to the water. Additional Road construction would not improve access to the landing.	Unlikely	Marginal	1
EX-4	Uplands Parking Pad	Adverse weather affect construction of support/access pad	The shoreline consists of large rock and boulders with no semblance of a beach. There are no improved landing ramps, areas of protected moorage, or protected storage areas along the beach.	LIKELY	Marginal	2
EX-5	Mob/Demob	Adverse weather affect mob/demob	The island is about 685 miles northwest of Anchorage, 135 miles northwest of Nome, and only 2.5 miles east of Big Diomedé Island in Russia. Lack of local competition will result in contractor traveling farther.	LIKELY	Marginal	2
EX-6	North Rubblemound Breakwater	Adverse weather affect rubblemound construction	Other Projects, Lack of local quarry competition will result in higher rock costs/bids	Very Unlikely	Significant	1
EX-7	South Rubblemound Breakwater	Adverse weather affect rubblemound construction	Other Projects, Lack of local quarry competition will result in higher rock costs/bids	Very Unlikely	Significant	1
EX-8	Nav Marker Base	Adverse weather affect Nav Marker Base construction	Base may be pre-cast or cast-in-place and is not a large item	Very Unlikely	Marginal	0
EX-9	Dredging Rock	Adverse weather affect Dredge Rock to project depth	Weather/Ice can impede Rock Dredging	Unlikely	Marginal	1
EX-10	Hydro Surveys	Adverse weather affect surveys	Sub-Contractor prices may be high for repeat work	Unlikely	Significant	3
EX-11	Habitat Enhancement	The slopes around the island of Little Diomedé are comprised of loose boulders. These boulders can be unstable and result in slides. The steep boulder-studded slopes, rocky cliffs, rich surrounding waters, and relatively low predator pressure at Little Diomedé Island create important breeding habitat for millions of seabirds.	The dredged material would be used for habitat enhancement in the nearshore environment approximately 1,500 feet from the construction site. This distance would provide a beneficial use/enhancement area away from existing village activities; the specific placement site would be determined with further coordination among resource agencies.	Unlikely	Significant	3
EX-12	Archeology	Artifacts and human remains are occasionally found on the surface, having eroded out of the soil or been exposed by construction work or other activities. Need for inspection of work site for unforeseen cultural artifacts or graves - Adverse weather affect artifact recovery.	Not likely but possible to excavate significant artifacts	Unlikely	Marginal	1
EX-13	Planning, Engineering, & Design	Adverse weather requiring additional effort	Design process will assess potential for future storm damage	Very Unlikely	Significant	1
EX-14	Construction Management	Adverse weather requiring additional effort	Design process will assess potential for future storm damage	Unlikely	Significant	3

Diomedede Navigation Improvements

Recon – Feasibility Abbreviated Risk Analysis

PDT Discussions and Conclusions

REF: FEASIBILITY SCOPING MEETING REPORT, REAL ESTATE PLAN APP G, & DIOMEDE ARA RISK REGISTER

1. Lands Acquisition (\$50k):

Concerns – Little Diomedede Island rises abruptly from the sea at a 40-degree angle to a height of nearly 1,300 feet and is characterized by steep slopes littered with substantial amounts of rock and boulders. Permits will need to be secured for construction. There could be complications or delays involving ownership of land and facilities. Acquisition costs might be higher than expected. Proximity of construction to existing facilities, eroding slopes, and lack of site access could present complications and added costs for the contractor.

Conclusions - The State of Alaska owns the tides and submerged lands lying within this section, and the City owns the uplands. Local village is motivated to make land available. It is likely the restricted site location would cause the contractor to employ unusual methods or unavailable materials to complete the work. The CWE adequately reflects tasks, productivities, and anticipated delays of the work due to site access. (%)

2. Relocate Helipad (\$0):

Concerns - The State Heliport could possibly pose as a determinate with the planning, designing, or implementation of the project, as there is an existing interagency land management agreement (ILMA) that protects a rather large portion of the Bering Sea. Moving facilities, graves or utilities adds liability, complexity and cost to the contractor's work.

Conclusions – Year-round access to Diomedede is currently limited to helicopter. The State of Alaska owns the helipad and has a protective interagency land management agreement that extends into the Bering Sea. No known utilities or facilities are located in this area and no relocations are required. It is not likely helipad relocation will be required for the project intent, nor would it cause the contractor to employ unusual methods or unavailable materials to complete the work. The CWE adequately reflects tasks, productivities, and scheduling of the work around the heliport activities. (%)

3. Access Road to the Landing (\$0):

Concerns - The project site is located on a narrow beach. The community's location is the only area which does not have near-vertical cliffs to the water. Equipment construction operations

and future maintenance may require surface improvement to/from the landing to support equipment, and/or vehicle traffic.

Conclusions – Access between facilities and along the beach provide adequate room to bring heavy equipment, labor and materials to the work. The un-improved areas may require minor leveling or filling to restore original grade, and existing improved surfaces may require additional fine grading and compacting which are all part of the planned scope of construction tasks. Additional road construction would not improve access to the planned landing site. The CWE adequately reflects tasks, productivities, and anticipated delays of the work due to existing road access. (%)

4. Uplands Parking and Storage Pad (\$0):

Concerns - The project site is located on a narrow beach. There are no improved landing ramps, areas of protected moorage, or protected storage areas along the beach. The community's location is the only area which does not have near-vertical cliffs to the water. Equipment construction operations and future maintenance may require surface improvement to support temporary facilities, equipment, and/or vehicle traffic.

Conclusions – Portions of the shoreline south of the helipad are occasionally reworked with heavy machinery to repair storm erosion and provide relatively level areas for storage and barge off-loading. The community's location provides adequate room to bring heavy equipment, labor and materials to the work, but do not allow for an expanded roadway of width sufficient for heavy equipment or large vehicles. The CWE adequately reflects tasks, productivities, and anticipated delays of the work due to existing storage and access. (%)

5. Mob / Demob (\$1.89m):

Concerns - The island is about 685 miles northwest of Anchorage, 135 miles northwest of Nome, and only 2.5 miles east of Big Diomed Island in Russia. It is nearly a full day's travel by boat to Wales, the nearest community with regular air transportation service. There are no improved landing ramps, areas of protected moorage, or protected storage areas along the beach. Lack of local competition will result in a contractor traveling farther. Well-equipped and competent contractors are not as numerous in Alaska as in the Lower 48. Contractors will only lower their bids enough to under-bid their competition. Competition among enough bidders to keep costs fair and reasonable depends on the time of year (contractors have work lined up by Jan-Mar) and distance to mobilize (few contractors are based on the far west coast). Remote projects scarcely have funding for the project construction work while it takes a lot of the available funding to transport labor and plant up to thousands of miles and back.

Conclusions – Responsible bidders are more available with the economic slow-down. If there is adequate competition from contractors on the Alaskan west coast, the job will be affordable. The CWE adequately reflects tasks, productivities, and anticipated costs of mobilizing minimal plant, equipment and labor from Anchorage and back. (%)

6. North Rubblemound Breakwater (\$5.63m):

Concerns - Little Diomed Island rises abruptly from the sea at a 40-degree angle to a height of nearly 1,300 feet and is characterized by steep slopes littered with substantial amounts of loose rock and boulders. These boulders can be unstable and result in slides. The climate at Little Diomed is subarctic, and dominated by the movements of weather systems and sea ice through the Bering Straits. Little Diomed is susceptible to low pressure events that could contribute to storm surge, but the water is too deep to allow the water to stack up and cause a significant surge. Winds are typically 20 to 30 mph, with sustained winds of 60 to 80 mph common, and storms may hamper construction.

Conclusions – Quantities of breakwater materials are fairly certain given the changing nature of the slope and beach. The CWE adequately reflects tasks, productivities, and anticipated delays of the planned utilidor revetment work. (%)

7. South Rubblemound Breakwater (\$8.90m):

Concerns - Little Diomed Island rises abruptly from the sea at a 40-degree angle to a height of nearly 1,300 feet and is characterized by steep slopes littered with substantial amounts of loose rock and boulders. These boulders can be unstable and result in slides. The climate at Little Diomed is subarctic, and dominated by the movements of weather systems and sea ice through the Bering Straits. Little Diomed is susceptible to low pressure events that could contribute to storm surge, but the water is too deep to allow the water to stack up and cause a significant surge. Winds are typically 20 to 30 mph, with sustained winds of 60 to 80 mph common, and storms may hamper construction.

Conclusions – Base may be pre-cast or cast-in-place and is not a large item. The CWE adequately reflects tasks, productivities, and anticipated delays of the planned nav marker base work. (%)

8. Nav Aids Marker (\$26k):

Concerns - A concrete base for the nav aid will be required. Construction under adverse conditions may be challenging.

Conclusions – A survey will be required prior to, and after completion of, any construction in order to verify the cross sections. The proposed project breakwater cross sections will be contoured to protect the landing area. The CWE adequately reflects tasks, productivities, and anticipated delays of the survey work. (%)

9. Dredging Rock (\$80k):

Concerns - The slopes around the island of Little Diomed are comprised of loose boulders. These boulders can be unstable and result in slides. Quantities of dredge materials are uncertain given the changing nature of the slope and beach.

Conclusions – Some leveling and rough grading of the existing ground is presumed in the work scope. The CWE adequately reflects tasks, productivities, and anticipated delays of the planned sub-grade and bedding work. (%)

10. Hydro Surveys (\$26k):

Concerns - Travel to and from Diomedes for business and/or pleasure is restricted by the concern over irregular transportation availability. Visitors to Diomedes have been stranded in the community for long periods of time, sometimes two or more weeks. Because of its location, the rocky beach in Diomedes is unprotected from wind and waves and is vulnerable to waves from the north, south, and west. The majority of likely survey subcontractors are located in southern Alaska where there is ample work, and will have to travel to this remote location and take measurements to confirm quantities under adverse conditions which drives availability and costs.

Conclusions – A survey will be required prior to, and after completion of, any construction in order to verify the cross sections. The proposed breakwater cross sections will be contoured to protect the landing area. The CWE adequately reflects tasks, productivities, and anticipated delays of the survey work. (17%)

11. Habitat Enhancement (\$0):

Concerns - The slopes around the island of Little Diomedes are comprised of loose boulders. These boulders can be unstable and result in slides. The steep boulder-studded slopes, rocky cliffs, rich surrounding waters, and relatively low predator pressure at Little Diomedes Island create important breeding habitat for millions of seabirds.

Conclusions – The dredged material would be used for habitat enhancement in the nearshore environment approximately 1,500 feet from the construction site. This distance would provide a beneficial use/enhancement area away from existing village activities; the specific placement site would be determined with further coordination among resource agencies. The CWE adequately reflects tasks, productivities, and anticipated delays of monitoring the planned revetment work. (%)

12. Archaeology (\$0):

Concerns - Artifacts and human remains are occasionally found on the surface, having eroded out of the soil or been exposed by construction work or other activities.

Conclusions – Much of the coarse shoreline material has been disturbed by construction of the school, helipad, and other infrastructure. Portions of the shoreline south of the helipad are occasionally reworked with heavy machinery to repair storm erosion and provide relatively level areas for storage and barge off-loading. The ground in these areas has been sufficiently disturbed or covered by extraneous materials that future surface disturbances are unlikely to

adversely affect undiscovered cultural resources. The CWE adequately reflects tasks, productivities, and anticipated delays of protecting adjacent facilities during the planned revetment work. (%)

13. PED (\$2.48m):

Concerns – Little Diomed Island rises abruptly from the sea at a 40-degree angle to a height of nearly 1,300 feet and is characterized by steep slopes littered with substantial amounts of loose rock and boulders. These boulders can be unstable and result in slides. The climate at Little Diomed is subarctic, and dominated by the movements of weather systems and sea ice through the Bering Straits. Because of its location, the rocky beach in Diomed is unprotected from wind and waves and is vulnerable to waves from the north, south, and west. The changing conditions may require alteration of the planned revetment work.

Conclusions – Long-term continued viability of the community is in jeopardy. The project will significantly improve the quality of life for the residents of Little Diomed as well as provide life/safety benefits. Some engineering support is typically required during normal construction activities to account for unforeseen and changed site conditions. (%)

14. S&A (\$1.32m):

Concerns - The Bering Strait is frequently rough and windy, making travel to and from the island in 18-foot to 20-foot open aluminum skiffs a hazardous undertaking, and several lives have been lost in these crossings. Travel to and from Diomed for business and/or pleasure is restricted by the concern over irregular transportation availability. Visitors to Diomed have been stranded in the community for long periods of time, sometimes two or more weeks. Because of the hazardous landing conditions at Diomed, local shipping companies have discontinued regular freight delivery service. Storms may hamper construction.

Conclusions –It is not likely the site conditions would cause the contractor to employ unusual methods or unavailable materials to complete the work. Construction Contract oversight is required during normal construction activities to account for safety, compliance, and unforeseen or changed site conditions. (%)

SUMMARY: Project risks are the potential elements, internal or external, anticipated or unforeseen, that can alter estimated construction execution costs in variance to the typical and reasonable estimate assumptions. The Risk Analysis seeks to identify the types of project risk; the likelihood of the risks impacting the project; and the level of impact on the project (and therefore on the project costs). The above discussion documents the attempts to identify risks to the St Michael Erosion Control project.

Basis of Cost Estimate

1. UPC/Project Title: DIO001, Navigation Improvements, Little Diomed Island, Alaska.
Certified Alt S3 CWE TPC = \$32.1m.
2. Description of Project: Construct two rubble mound breakwaters, and dredging from a relatively small near-shore area, that would provide shelter from north storms at Diomed, Alaska.
3. Documents used for estimate: Little Diomed AFB Doc v7 Report; Little Diomed RE Plan; 3Jan2012 draft HH appendix; Diomed Alternative Quantities, Diomed Nav Imp Feasibility Study.
4. Estimating Software: EXCEL, and MCACES 2nd Gen.
5. Databases/Libraries:
Labor: Alaska Labor & Mech 2012, Davis Bacon wage decision & AKDOL Pam 600 dated 5/17/12
Equipment: MII Equipment 2013 Region 09 – CW, Remote construction fuel costs Jan 2013; and marine fuel price check 7 Aug 2012.
Cost Book: MII English Cost Book 2010 NOTE: Cost review started before 2012 Cost Book.
6. Direct Cost Markups:
Productivity: 100%
Overtime (Work Schedule): BREAKWATERS, DREDGING, (7-12) 26.19%.
Sales Tax: Diomed 3.0%
Material Escalation: 7.35% (See NOTE on Cost Book 2010 above).
7. Contractor Markups:
Payroll Tax: AK, Excavation
FOOH: Prime – 6.19%, Sub – 5%
HOOH: Prime – 5%, Sub – 7%
Profit: Prime – 9.40% PWG, Sub – 10%
Bond: Prime – 0.72%, Sub – 1.22%
8. Owner Markups:
Escalation to Contract MPt: (Jan 2016) 17.2%;
Contingency: Contract - 24.24% (ARA) , Lands – 14.58%
SIOH: 8% PED: 2.5%
9. Factors impacting the estimate: Weather, fuel, rock, shipping distance.
10. Major Assumptions: Assume work requires 2 summer (90 day) seasons to accomplish. Survey, mining (quarry), and transportation (barge & helicopter) subs are required to accomplish the tasks in this estimate. Assumed PRIME owns all the heavy equipment used at the site.
11. Narrative with Estimate Development and Schedule Considerations:

Four alternatives (N1, S1, S2, S3) were priced for evaluation. These represent variations in the breakwater configuration on the north and south sides of the helipad. Alternate S3 was selected for the Risk Analysis as it represents the risks common to the alternatives. Similar risks apply to all alternatives with similar construction and proximity.

Village of Diomede is located on the west coast of Little Diomede Island in the Bering Straits, 135 miles northwest of Nome. The community is situated on a flat-topped, steep-sided island that is very isolated by its location. The community is 2.5 miles from Big Diomede, which belongs to Russia; 0.6 miles from Russian waters and airspace; 27 miles from the Alaskan mainland; and about 685 air miles northwest of Anchorage.

Rough seas and persistent fog that shrouds the island characterizes the island during the summer months. Summer temperatures average 40 to 50 °F. Winter temperatures average from -10 to 6 °F. Annual precipitation averages 10 inches, and annual snowfall averages 30 inches. During summer months, cloudy skies and fog prevail. Winds blow consistently from the north, averaging 15 knots, with gusts of 60 to 80 mph. Storms at the site move through the area very rapidly and there is no place to run for shelter. Generally storms occur in the fall months.

The Bering Strait is generally frozen between mid-December and mid-June. Seasonal sea ice constrains the shipping season for the importation of construction materials and equipment and there are no offloading facilities other than the unimproved shore. There is very limited space available in Diomede to serve as a staging area to store equipment or materials. Conditions permitting, a temporary airstrip may be established on a stable section of sea ice between the two islands. During the winter months of 2008 and 2009, the ice was too thin to allow construction of the ice runway.

Diomede possesses a helipad and, conditions permitting, receives mail once a week via helicopter when not accessible by plane. The mail helicopter carries four passengers or 1,300 pounds of small freight; however, mail has priority because the U.S. Postal Service (USPS) subsidizes this service. Bad weather and/or mechanical problems frequently disrupt service and several weeks often can pass between flights.

Little Diomede is a remote location so crew members will need to be flown to the site in a chartered helicopter, or ship up with the construction equipment. Located in the middle of the Bering Strait, the island is nearly a full day's travel by boat to Wales, the nearest community with regular air transportation service. There is no practical current or potential vehicular access to transport goods and supplies from any other portion of the island. The only access to the rest of the island is along walking trails.

Once on site the crew that will work on the project will need to have room and board provided. There is limited space to house a construction crew in Diomede. During recent construction to improve the school, the construction crew was housed in the

school, including during periods of classes. It may be possible for this contractor to put his crew up at the school. It is anticipated that the contractor will work long shifts, 12 hours a day, 7 days a week with minimum crew to expedite completion and reduce cost.

Large boulders and cobbles characterize the shoreline, intertidal, and near-shore habitat. The terrestrial habitat on Little Diomed Island consists largely of boulder fields, cliffs, and rocky spires. The slopes around the island of Little Diomed are comprised of loose boulders. These boulders can be unstable and result in slides. The boulders are also home to many species of birds. Nesting seabirds are the dominant animal life using the Little Diomed terrestrial habitat. Seabird use of Little Diomed Island is seasonal. Migration to the island begins with the breakup of sea ice in April and continues until mid-June. Polar bears occur in the vicinity of, and have denned on, Little Diomed Island. At Diomed, critical habitat includes the island itself, a 1-mile "no disturbance zone" surrounding the island, as well as all sea ice, regardless of seasonal presence, out to the international border.

Due to the rocky beach and wave climate, landing any sort of vessel at Diomed is a risky venture. Barges delivering fuel and goods must either lighter goods to shore using small skiffs or construct a crude landing from material available locally. Because of the hazardous landing conditions at Diomed, local shipping companies have discontinued regular freight delivery service. Small freight shipments are received through the weekly helicopter service; or, for a limited time during the freeze-up, by plane; however, larger items must wait for a sufficiently large accumulation to justify the expense of barge delivery. Typically this delivery interval is 2 or more years. Fuel oil is delivered once a year.

There are no notable surface water sources on Little Diomed Island. Water for personal use by residents is drawn from a mountain spring and stored in a 434,000 steel tank, and families haul water from this source. The tank is filled for winter use, but the water supply typically runs out around March. The contractor will need to make sure that there is adequate potable water, food, heating and motor fuel provided for use at the site. He could bring up his own fuel/water barge, but the nature of the shore conditions make off-loading extremely difficult and prohibit long-term mooring. Purchase of commercially-supplied fuel would need to be coordinated early in the year so that arrangements could be made to have additional fuel delivered to the site and stored. Installing water and waste storage tanks would have to be considered for extended stays.

Rubble Mound Construction: It is expected that the 80,000Lcy of stone for breakwaters will come from Nome. There is little room to offload and stockpile the stone. By the end of the construction season, the breakwaters will need to be protected with 16-ton armor stone. The breakwater construction is anticipated to take two years to complete,

assuming a contract award in the fall. In order to attract competitive bidders, it is recommended that the project be advertised early to interest capable contractors to bid on this project. The contract should be awarded NLT October to allow the contractor winter time to prepare the logistics for quarry production, rock stockpile and delivery; and to schedule barge mobilization and setup at the start of the open-water season.

Construction Dredging: Depending on the size of the boulders, blasting may be required and was assumed in the estimate. Material would be dredged from a relatively small area, 0.2 to 0.7 acre, of shoreline to create a safe approach and landing path for small vessels. This modified area may consist of finer material (smaller cobbles or gravel) than the surrounding boulders, especially if explosives are used to break apart subsurface boulders or bedrock outcroppings. Dredging work inside the breakwaters can be accomplished with land-based equipment used for breakwater construction. The most effective dredging equipment and methods would be left as an option for the contractor to determine.

This estimate was based on a full and open procurement methodology assuming the prime contractor is performing the placement of rock, dredging, and debris removal. The work season length, remote site location, distance to resources, wave climate, lack of local protection from wind and/or wave events are just some of the conditions that a contractor will need to consider when proposing on this contract.

It is anticipated that there will be approximately 100 days available per season before ice formation and storms prevent work being performed at the site. Equipment needs to be demobilized from the site before the Bering Sea ices and prevents travel to or from the site.

Direct costs for land-based dredging tasks were developed in MCACES like any other detailed items. Risk analysis and quantities calculations were done in EXCEL.

The Total Project Cost for Alt S3 was reviewed and certified January 2014.

**** TOTAL PROJECT COST SUMMARY ****

PROJECT: Little Diomedes Island Navigation Improvements, Alt N1
LOCATION: Little Diomedes, Alaska

DISTRICT: POA Alaska
POC: CHIEF, COST ENGINEERING, Karl Harvey

PREPARED: 3/13/2014

This Estimate reflects the scope and schedule in report: Little Diomedes AFB Draft Report

WBS Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
WBS NUMBER	Feature & Sub-Feature Description	COST (\$K)	CNTG (%)	CNTG (%)	TOTAL (\$K)	ESC (%)	COST (\$K)	CNTG (%)	TOTAL (\$K)	Spent Thru: 1-Mar-13 (\$K)	COST (\$K)	CNTG (%)	TOTAL (\$K)	
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
10	BREAKWATER & SEAWALLS	\$16,663	\$5,469	33%	\$22,132	3.5%	\$17,253	\$5,662	\$22,914	\$0	\$0	\$18,171	\$5,964	\$24,135
12	NAVIGATION PORTS & HARBORS	\$76	\$32	42%	\$108	3.0%	\$79	\$33	\$111	\$0	\$0	\$83	\$35	\$117
CONSTRUCTION ESTIMATE TOTALS:		\$16,739	\$5,500		\$22,240	3.5%	\$17,331	\$5,695	\$23,026	\$0	\$0	\$18,254	\$5,998	\$24,252
01	LANDS AND DAMAGES	\$50	\$7	15%	\$57	3.5%	\$52	\$8	\$59	\$0	\$0	\$52	\$8	\$60
30	PLANNING, ENGINEERING & DESIGN	\$2,510	\$675	27%	\$3,185	5.2%	\$2,641	\$710	\$3,351	\$0	\$0	\$2,758	\$742	\$3,500
31	CONSTRUCTION MANAGEMENT	\$1,339	\$339	25%	\$1,678	5.2%	\$1,409	\$356	\$1,765	\$0	\$0	\$1,580	\$400	\$1,980
PROJECT COST TOTALS:		\$20,638	\$6,522	32%	\$27,160		\$21,432	\$6,769	\$28,202	\$0	\$0	\$22,644	\$7,147	\$29,792

- Mandatory by Regulation** CHIEF, COST ENGINEERING, Karl Harvey
- Mandatory by Regulation** PROJECT MANAGER, Dave Williams
- Mandatory by Regulation** CHIEF, REAL ESTATE, Thomas Kreitzschmar
- CHIEF, PLANNING, Bruce Sexauer
- CHIEF, ENGINEERING, Dave Frenier
- CHIEF, OPERATIONS, Patrick Coullahan
- CHIEF, CONSTRUCTION, Dave Gerland
- CHIEF, CONTRACTING, Chris Tew
- CHIEF, PM/PB, Karen Farmer
- CHIEF, DPM, Larry McCallister

ESTIMATED FEDERAL COST: 100% \$29,792
ESTIMATED NON-FEDERAL COST: 0% \$0
ESTIMATED TOTAL PROJECT COST: \$29,792

O&M OUTSIDE OF TOTAL PROJECT COST:

**** TOTAL PROJECT COST SUMMARY ****

**** CONTRACT COST SUMMARY ****

PROJECT: Little Diomedes Island Navigation Improvements, Alt N1
 LOCATION: Little Diomedes, Alaska
 This Estimate reflects the scope and schedule in report: Little Diomedes AFB Draft Report

DISTRICT: POA Alaska
 POC: CHIEF, COST ENGINEERING, Karl Harvey

PREPARED: 3/13/2014

WBS NUMBER	WBS Description	ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		COST (\$K)	CNTG (%)	TOTAL (\$K)	RISK BASED	ESC (%)	COST (\$K)	CNTG (%)	TOTAL (\$K)	Mid-Point Date	INFLATED (%)	COST (\$K)	CNTG (%)	FULL (\$K)
	Civil Works													
	Feature & Sub-Feature Description													
	PHASE 1 or CONTRACT 1													
10	BREAKWATER & SEAWALLS	\$1,845	37%	\$2,531	3.5%	\$1,910	\$711	\$2,621	2017Q4	5.3%	\$2,012	\$748	\$2,760	
10	BREAKWATER & SEAWALLS	\$14,787	32%	\$19,564	3.5%	\$15,310	\$4,945	\$20,256	2017Q4	5.3%	\$16,126	\$5,209	\$21,335	
10	BREAKWATER & SEAWALLS	\$31	19%	\$37	3.5%	\$32	\$6	\$38	2017Q4	5.3%	\$34	\$6	\$40	
12	NAVIGATION PORTS & HARBORS	\$55	43%	\$79	3.0%	\$57	\$24	\$81	2017Q4	5.3%	\$60	\$26	\$85	
12	NAVIGATION PORTS & HARBORS	\$21	39%	\$30	3.0%	\$22	\$9	\$30	2017Q4	5.3%	\$23	\$9	\$32	
CONSTRUCTION ESTIMATE TOTALS:		\$16,739	33%	\$22,240		\$17,331	\$5,695	\$23,026			\$18,254	\$5,998	\$24,252	
01	LANDS AND DAMAGES	\$50	15%	\$57	3.5%	\$52	\$8	\$59	2015Q3	1.0%	\$52	\$8	\$60	
30 PLANNING, ENGINEERING & DESIGN														
2.5%	Project Management	\$418	27%	\$530	5.2%	\$440	\$118	\$558	2015Q3	2.1%	\$449	\$121	\$570	
1.0%	Planning & Environmental Compliance	\$167	27%	\$212	5.2%	\$176	\$47	\$223	2015Q3	2.1%	\$179	\$48	\$228	
5.5%	Engineering & Design	\$921	27%	\$1,169	5.2%	\$969	\$261	\$1,230	2015Q3	2.1%	\$989	\$266	\$1,255	
1.0%	Engineering Tech Review ITR & VE	\$167	27%	\$212	5.2%	\$176	\$47	\$223	2015Q3	2.1%	\$179	\$48	\$228	
2.0%	Contracting & Reographics	\$167	27%	\$212	5.2%	\$176	\$47	\$223	2015Q3	2.1%	\$179	\$48	\$228	
1.5%	Engineering During Construction	\$335	27%	\$425	5.2%	\$352	\$95	\$447	2017Q4	12.1%	\$395	\$106	\$502	
1.5%	Planning During Construction	\$251	27%	\$319	5.2%	\$264	\$71	\$335	2017Q4	12.1%	\$296	\$80	\$376	
0.5%	Project Operations	\$84	27%	\$107	5.2%	\$88	\$24	\$112	2015Q3	2.1%	\$90	\$24	\$114	
31 CONSTRUCTION MANAGEMENT														
3.5%	Construction Management	\$586	25%	\$734	5.2%	\$617	\$156	\$773	2017Q4	12.1%	\$691	\$175	\$866	
2.0%	Project Operation:	\$335	25%	\$420	5.2%	\$352	\$89	\$442	2017Q4	12.1%	\$395	\$100	\$495	
2.5%	Project Management	\$418	25%	\$524	5.2%	\$440	\$111	\$551	2017Q4	12.1%	\$493	\$125	\$618	
CONTRACT COST TOTALS:		\$20,638		\$27,160		\$21,432	\$6,769	\$28,202			\$22,644	\$7,147	\$29,792	

**** TOTAL PROJECT COST SUMMARY ****

PROJECT: Little Diomedes Island Navigation Improvements, Alt S2
LOCATION: Little Diomedes, Alaska

DISTRICT: POA Alaska
POC: CHIEF, COST ENGINEERING, Karl Harvey

PREPARED: 3/13/2014

This Estimate reflects the scope and schedule in report: Little Diomedes AFB Draft Report

WBS Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
WBS NUMBER	Feature & Sub-Feature Description	COST (\$K)	CNTG (\$K)	CNTG (%)	TOTAL (\$K)	ESC (%)	COST (\$K)	CNTG (\$K)	TOTAL (\$K)	Spent Thru: 1-Mar-13 (\$K)	L	COST (\$K)	CNTG (%)	FULL (\$K)
A	B	C	D	E	F	G	H	I	J	K		M	N	O
10	BREAKWATER & SEAWALLS	\$17,246	\$5,657	33%	\$22,903	3.5%	\$17,856	\$5,857	\$23,713	\$0		\$18,807	\$6,169	\$24,976
12	NAVIGATION PORTS & HARBORS	\$103	\$43	42%	\$146	3.0%	\$106	\$45	\$150	\$0		\$111	\$47	\$158
CONSTRUCTION ESTIMATE TOTALS:		\$17,349	\$5,700		\$23,049	3.5%	\$17,962	\$5,901	\$23,863	\$0		\$18,919	\$6,216	\$25,135
01	LANDS AND DAMAGES	\$50	\$7	15%	\$57	3.5%	\$52	\$8	\$59	\$0		\$52	\$8	\$60
30	PLANNING, ENGINEERING & DESIGN	\$2,601	\$700	27%	\$3,301	5.2%	\$2,737	\$736	\$3,473	\$0		\$2,858	\$769	\$3,627
31	CONSTRUCTION MANAGEMENT	\$1,388	\$351	25%	\$1,739	5.2%	\$1,460	\$369	\$1,830	\$0		\$1,638	\$414	\$2,052
PROJECT COST TOTALS:		\$21,388	\$6,758	32%	\$28,146		\$22,211	\$7,014	\$29,225	\$0		\$23,467	\$7,406	\$30,873

Mandatory by Regulation CHIEF, COST ENGINEERING, Karl Harvey
Mandatory by Regulation PROJECT MANAGER, Dave Williams
Mandatory by Regulation CHIEF, REAL ESTATE, Thomas Kreitzschmar
 CHIEF, PLANNING, Bruce Sexauer
 CHIEF, ENGINEERING, Dave Frenier
 CHIEF, OPERATIONS, Patrick Coullahan
 CHIEF, CONSTRUCTION, Dave Gerland
 CHIEF, CONTRACTING, Chris Tew
 CHIEF, PM/PB, Karen Farmer
 CHIEF, DPM, Larry McCallister

ESTIMATED FEDERAL COST: 100% ESTIMATED NON-FEDERAL COST: 0%
ESTIMATED TOTAL PROJECT COST: \$30,873

O&M OUTSIDE OF TOTAL PROJECT COST:

**** TOTAL PROJECT COST SUMMARY ****

**** CONTRACT COST SUMMARY ****

PROJECT: Little Diomedes Island Navigation Improvements, Alt S2
 LOCATION: Little Diomedes, Alaska
 This Estimate reflects the scope and schedule in report; Little Diomedes AFB Draft Report

DISTRICT: POA Alaska
 POC: CHIEF, COST ENGINEERING, Karl Harvey

PREPARED: 3/13/2014

WBS NUMBER	WBS Structure	ESTIMATED COST						PROJECT FIRST COST (Constant Dollar Basis)						TOTAL PROJECT COST (FULLY FUNDED)																
		COST (\$K)	CNTG (\$K)	D	CNTG (%)	E	TOTAL (\$K)	F	ESC (%)	G	COST (\$K)	H	CNTG (\$K)	I	TOTAL (\$K)	J	Mid-Point Date	P	INFLATED (%)	L	COST (\$K)	M	CNTG (\$K)	N	FULL (\$K)	O				
		Estimate Prepared: 30-Jan-13 Effective Price Level: 1-Mar-13												Program Year (Budget EC): 2015 Effective Price Level Date: 1 OCT 14																
		RISK BASED																												
A	Civil Works																													
	PHASE 1 or CONTRACT 1																													
10	BREAKWATER & SEAWALLS	\$1,839	\$684		37%	\$2,523		3.5%	\$1,904	\$708	\$2,612		3.5%	\$15,921	\$5,142	\$21,063	2017Q4	5.3%	\$2,005	\$746	\$2,751		5.3%	\$16,769	\$5,416	\$22,185				
10	BREAKWATER & SEAWALLS	\$15,377	\$4,967		32%	\$20,343		3.5%	\$32	\$6	\$38		3.0%	\$84	\$36	\$120	2017Q4	5.3%	\$89	\$38	\$127		5.3%	\$23	\$9	\$32				
10	BREAKWATER & SEAWALLS	\$31	\$6		19%	\$37		3.5%	\$22	\$9	\$30		3.0%	\$0			2017Q4	5.3%	\$18,919	\$6,216	\$25,135		1.0%	\$62	\$8	\$60				
12	NAVIGATION PORTS & HARBORS	\$82	\$35		43%	\$117		3.5%	\$457	\$123	\$579		5.2%	\$182	\$49	\$231	2015Q3	2.1%	\$466	\$125	\$592		2.1%	\$186	\$50	\$236				
12	NAVIGATION PORTS & HARBORS	\$21	\$8		39%	\$29		5.2%	\$1,004	\$270	\$1,274		5.2%	\$182	\$49	\$231	2015Q3	2.1%	\$1,025	\$276	\$1,300		2.1%	\$186	\$50	\$236				
								5.2%	\$182	\$49	\$231		5.2%	\$365	\$98	\$463	2015Q3	2.1%	\$186	\$50	\$236		2.1%	\$409	\$110	\$520				
								5.2%	\$274	\$74	\$347		5.2%	\$274	\$74	\$347	2017Q4	12.1%	\$307	\$83	\$389		12.1%	\$307	\$83	\$389				
								5.2%	\$92	\$25	\$116		5.2%	\$92	\$25	\$116	2015Q3	2.1%	\$93	\$25	\$119		2.1%	\$93	\$25	\$119				
31	CONSTRUCTION MANAGEMENT							5.2%	\$639	\$162	\$800		5.2%	\$639	\$162	\$800	2017Q4	12.1%	\$716	\$181	\$897		12.1%	\$716	\$181	\$897				
3.5%	Construction Management	\$607	\$154		25%	\$761		5.2%	\$365	\$92	\$457		5.2%	\$365	\$92	\$457	2017Q4	12.1%	\$409	\$104	\$513		12.1%	\$409	\$104	\$513				
2.0%	Project Operation:	\$347	\$88		25%	\$435		5.2%	\$457	\$116	\$572		5.2%	\$457	\$116	\$572	2017Q4	12.1%	\$512	\$130	\$642		12.1%	\$512	\$130	\$642				
2.5%	Project Management	\$434	\$110		25%	\$544			\$22,211	\$7,014	\$29,225			\$22,211	\$7,014	\$29,225			\$23,467	\$7,406	\$30,873			\$23,467	\$7,406	\$30,873				
	CONTRACT COST TOTALS:	\$21,388	\$6,758			\$28,146																								

**** TOTAL PROJECT COST SUMMARY ****

PROJECT: Little Diomedes Island Navigation Improvements, Alt S1
LOCATION: Little Diomedes, Alaska

DISTRICT: POA Alaska
POC: CHIEF, COST ENGINEERING, Karl Harvey

PREPARED: 3/13/2014

This Estimate reflects the scope and schedule in report: Little Diomedes AFB Draft Report

WBS Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
WBS NUMBER	Feature & Sub-Feature Description	COST (\$K)	CNTG (%)	CNTG (\$K)	TOTAL (\$K)	ESC (%)	COST (\$K)	CNTG (\$K)	TOTAL (\$K)	Spent Thru: 1-Mar-13 (\$K)	L	COST (\$K)	CNTG (\$K)	FULL (\$K)
A	B	C	D	E	F	G	H	I	J	K		M	N	O
10	BREAKWATER & SEAWALLS	\$14,790	33%	\$4,864	\$19,655	3.5%	\$15,313	\$5,036	\$20,350	\$0		\$16,129	\$5,305	\$21,434
12	NAVIGATION PORTS & HARBORS	\$105	42%	\$44	\$149	3.0%	\$108	\$45	\$153	\$0		\$114	\$48	\$161
CONSTRUCTION ESTIMATE TOTALS:		\$14,895		\$4,908	\$19,803	3.5%	\$15,421	\$5,082	\$20,503	\$0		\$16,243	\$5,353	\$21,595
01	LANDS AND DAMAGES	\$50	15%	\$7	\$57	3.5%	\$52	\$8	\$59	\$0		\$52	\$8	\$60
30	PLANNING, ENGINEERING & DESIGN	\$2,233	27%	\$601	\$2,834	5.2%	\$2,349	\$632	\$2,981	\$0		\$2,453	\$660	\$3,113
31	CONSTRUCTION MANAGEMENT	\$1,191	25%	\$301	\$1,492	5.2%	\$1,253	\$317	\$1,570	\$0		\$1,405	\$356	\$1,761
PROJECT COST TOTALS:		\$18,369	32%	\$5,818	\$24,187		\$19,075	\$6,038	\$25,114	\$0		\$20,154	\$6,376	\$26,529

- Mandatory by Regulation** CHIEF, COST ENGINEERING, Karl Harvey
- Mandatory by Regulation** PROJECT MANAGER, Dave Williams
- Mandatory by Regulation** CHIEF, REAL ESTATE, Thomas Kreitzschmar
- CHIEF, PLANNING, Bruce Sexauer
- CHIEF, ENGINEERING, Dave Frenier
- CHIEF, OPERATIONS, Patrick Coullahan
- CHIEF, CONSTRUCTION, Dave Gerland
- CHIEF, CONTRACTING, Chris Tew
- CHIEF, PM/PB, Karen Farmer
- CHIEF, DPM, Larry McCallister

ESTIMATED FEDERAL COST: 100% \$26,529
ESTIMATED NON-FEDERAL COST: 0% \$0
ESTIMATED TOTAL PROJECT COST: \$26,529

O&M OUTSIDE OF TOTAL PROJECT COST:

**** TOTAL PROJECT COST SUMMARY ****

**** CONTRACT COST SUMMARY ****

PROJECT: Little Diomedes Island Navigation Improvements, Alt S1
 LOCATION: Little Diomedes, Alaska
 This Estimate reflects the scope and schedule in report; Little Diomedes AFB Draft Report

DISTRICT: POA Alaska
 POC: CHIEF, COST ENGINEERING, Karl Harvey

PREPARED: 3/13/2014

WBS Structure		ESTIMATED COST					PROJECT FIRST COST (Constant Dollar Basis)					TOTAL PROJECT COST (FULLY FUNDED)				
WBS NUMBER	Feature & Sub-Feature Description	COST (\$K)	CNTG (\$K)	CNTG (%)	TOTAL (\$K)	ESC (%)	COST (\$K)	CNTG (\$K)	TOTAL (\$K)	Mid-Point Date	INFLATED (%)	COST (\$K)	CNTG (%)	TOTAL (\$K)		
A	B	C	D	E	F	G	H	I	J	P	L	M	N	O		
	Civil Works															
	PHASE 1 or CONTRACT 1															
10	BREAKWATER & SEAWALLS	\$1,861	\$692	37%	\$2,553	3.5%	\$1,927	\$717	\$2,643	2017Q4	5.3%	\$2,029	\$755	\$2,784		
10	BREAKWATER & SEAWALLS	\$12,898	\$4,166	32%	\$17,065	3.5%	\$13,355	\$4,314	\$17,668	2017Q4	5.3%	\$14,066	\$4,543	\$18,609		
10	BREAKWATER & SEAWALLS	\$31	\$6	19%	\$37	3.5%	\$32	\$6	\$38	2017Q4	5.3%	\$34	\$6	\$40		
12	NAVIGATION PORTS & HARBORS	\$83	\$36	43%	\$119	3.0%	\$86	\$37	\$123	2017Q4	5.3%	\$90	\$39	\$129		
12	NAVIGATION PORTS & HARBORS	\$21	\$8	39%	\$30	3.0%	\$22	\$9	\$31	2017Q4	5.3%	\$23	\$9	\$32		
CONSTRUCTION ESTIMATE TOTALS:		\$14,895	\$4,908	33%	\$19,803		\$15,421	\$5,082	\$20,503			\$16,243	\$5,353	\$21,595		
01	LANDS AND DAMAGES	\$50	\$7	15%	\$57	3.5%	\$52	\$8	\$59	2015Q3	1.0%	\$52	\$8	\$60		
30	PLANNING, ENGINEERING & DESIGN															
2.5%	Project Management	\$372	\$100	27%	\$472	5.2%	\$391	\$105	\$497	2015Q3	2.1%	\$400	\$107	\$507		
1.0%	Planning & Environmental Compliance	\$149	\$40	27%	\$189	5.2%	\$157	\$42	\$199	2015Q3	2.1%	\$160	\$43	\$203		
5.5%	Engineering & Design	\$819	\$220	27%	\$1,039	5.2%	\$862	\$232	\$1,093	2015Q3	2.1%	\$880	\$237	\$1,116		
1.0%	Engineering Tech Review ITR & VE	\$149	\$40	27%	\$189	5.2%	\$157	\$42	\$199	2015Q3	2.1%	\$160	\$43	\$203		
2.0%	Contracting & Reprographics	\$298	\$80	27%	\$378	5.2%	\$314	\$64	\$398	2017Q4	12.1%	\$352	\$95	\$446		
1.5%	Engineering During Construction	\$223	\$60	27%	\$283	5.2%	\$235	\$63	\$298	2017Q4	12.1%	\$263	\$71	\$334		
0.5%	Planning During Construction	\$74	\$20	27%	\$94	5.2%	\$78	\$21	\$99	2015Q3	2.1%	\$79	\$21	\$101		
31	CONSTRUCTION MANAGEMENT															
3.5%	Construction Management	\$521	\$132	25%	\$653	5.2%	\$548	\$139	\$687	2017Q4	12.1%	\$615	\$156	\$770		
2.0%	Project Operation:	\$298	\$75	25%	\$373	5.2%	\$314	\$79	\$393	2017Q4	12.1%	\$352	\$89	\$441		
2.5%	Project Management	\$372	\$94	25%	\$466	5.2%	\$391	\$99	\$490	2017Q4	12.1%	\$439	\$111	\$550		
CONTRACT COST TOTALS:		\$18,369	\$5,818		\$24,187		\$19,075	\$6,038	\$25,114			\$20,154	\$6,376	\$26,529		